



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,685	11/13/2003	Evgeniya Freydina	2003P86278US	9109
37462	7590	02/17/2010		
LANDO & ANASTASI, LLP ONE MAIN STREET, SUITE 1100 CAMBRIDGE, MA 02142			EXAMINER DRODGE, JOSEPH W	
			ART UNIT	PAPER NUMBER
			1797	
			NOTIFICATION DATE	DELIVERY MODE
			02/17/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@ll-a.com
gengelso@ll-a.com

Office Action Summary	Application No. 10/712,685	Applicant(s) FREYDINA ET AL.	
	Examiner Joseph W. Drodge	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-20,22 and 27-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20,22 and 27-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1797

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

** Throughout below office action 103 rejections, "c" denotes referenced patent column, "l" denotes line number of the column, and "p" denotes referenced paragraph of PGPUBS locations.

Claims 1,3-20,22 and 27-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liang et al 7,572,359 in view of Batchelder et al patent 6,126,805, and if necessary in view of Stoddard patent 2,912,372 and/or Liang et al patent 5,292,422. For independent claims 1 and 11, Liang discloses introducing 1st portions of water from point of entry to vessel(s), reservoir(s) and/or surge tanks, while other portions of water are introduced in series or parallel flow into an electrochemical device, notably an electrodeionization (EDI) device [as in claim 10], for removal of undesirable (especially hardness-causing) species/impurities, the vessel(s), reservoir(s) and/or surge tanks storing water and distributing water therefrom to points of use in a household or alternatively to an industrial point of use. See especially c 4, l 23-52 re point of entry, c 4, l 52-64 and c 12, l 5-16 re system distribution and vessel storage and c 7, l 43-59 re EDI operation. An electric current and electric field is applied either uniformly or non-uniformly for which the polarity may occasionally be reversed (c 7, l 47-67). For independent claim 17, applying of electric current implies a power supply, and applying non-uniformly or as a gradient, implies control/controller (c 7, l 47-67). For claim 22, c 4, l 40-52 also discloses household distribution system with 'spigot', hence inferring at least kitchen sink faucet.

The claims all differ in requiring that the electrical current is maintained below a limiting current density to suppress hydroxyl ion generation. Batchelder teaches that EDI-containing water treatment systems are operated near or below the limiting current density, sometimes in combination with reversal of direction of the electric current (as in Batchelder) in order to mitigate the precipitation and deposition of minerals to contact surfaces (column 1, line 62-column 2, line 19 and column 4, line 42-column 5, line 2, etc.) Such actions are taught as reducing "water splitting" or formation of hydroxyl ions. More specifically, in column 8, lines

Art Unit: 1797

34-47 and column 12, lines 35-38 and 45-51, Batchelder explicitly teaches operating the anion exchange membranes of an electrodialysis or electrodeionizing device to have a reduced water-splitting capacity and to operate the cation exchange membranes of such device to have a relatively limited water-splitting capacity compared to enhanced water splitting membranes, with such objectives realized by limiting current densities [as required by claim 3].

Thus, it would have been obvious for one of ordinary skill in the art to have controlled the EDI process in the Liang et al system by operating near or below the limiting current density to minimize water splitting, or formation of hydroxyl ions, as taught by Batchelder, to further limit the amount of precipitation occurring on the EDI surfaces and downstream of the device especially in the concentrating stream, so as to optimize the EDI operation in removal of salts and other contaminants.

If necessary, Liang '422 teaches in embodiment of figure 5, to use an EDI unit for domestic appliances such as replacing or in conjunction with home water softeners and thus on to household distribution points, in a system also employing diverted flow to tank/reservoir/vessel 180 and recirculation (c 10, l 38- c 11, l 18). Also if necessary, Stoddard explicitly teaches water treatment through an electrochemical, softening unit to provide water to household appliances such as dishwashers (c 1, l 25-35 with c 5, l 51-c 6, l 47).

Liang '359 also discloses the following for dependent claims: measuring, monitoring and adjusting of water properties & parameters for claims 4-7,13-16,19,20,28 and 30-32 (c 4, l 60-62 and c 13, l 15-40), water distribution for claim 6,18 and 15 (c 4 and c 12), flow rate adjustment for claims 7 and 16 (c 4, l 60-61), storing of treated and untreated water in pressurized reservoir

Art Unit: 1797

system for claims 8,12,29,30 and 9 (c 4, l 60-61), the parallel/serial arrangement providing mixing of treated and untreated water for claim 27, .

Claims 1,8-12,17,18,22,27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over one of Liang et al 5,292,422 or Willman et al PGPUBS US 2004/0118780 in view of Batchelder et al patent 6,126,805, and if necessary in view of Stoddard patent 2,912,372.

For independent claims 1 and 11, Liang discloses introducing 1st portions of water from point of entry to vessel(s), reservoir(s) and/or surge tanks, while other portions of water are introduced in series or parallel flow into an electrochemical device, notably an electrodeionization (EDI) device 100 [as in claim 10], for removal of undesirable (especially hardness-causing) species/impurities, the vessel(s), reservoir(s) and/or surge tank 180 storing water and distributing water therefrom to points of use in a household or alternatively to an industrial point of use. Generally all disclosed at c 10, l 38- c 11, l 18 and fig 5. An electric current and electric field is applied either uniformly or non-uniformly for which the polarity may occasionally be reversed (c 7, l 47-67). For independent claim 17, applying of electric current implies a power supply, and applying it non-uniformly or as a gradient, implies control/controller (c 10, l 19-28). For claim 22, c 10, l 40-42 also discloses household distribution system with , hence inferring at least kitchen sink faucet.

For independent claims 1 and 11, Willman et al discloses introducing 1st portions of water from point of entry to vessel(s), reservoir(s) and/or surge tanks, while other portions of water are introduced in series or parallel flow into an electrochemical device, notably an electrodeionization (EDI) device 56 [as in claim 10], for removal of undesirable (especially hardness-causing) species/impurities, the vessel(s), reservoir(s) and/or surge tank 26 storing

Art Unit: 1797

water and distributing water therefrom to points of use in a household or alternatively to an industrial point of use. See especially p 29 and figure 3. Distribution of water for household use is inferred by disclosure of providing of drinking water (p 16). An electric current and electric field is applied either uniformly or non-uniformly for which the polarity may occasionally be reversed (p 21-22). For independent claim 17, applying of electric current implies a power supply, and applying non-uniformly or as a gradient, implies control/controller (p 32).

The claims all differ in requiring that the electrical current is maintained below a limiting current density to suppress hydroxyl ion generation. Batchelder teaches that EDI-containing water treatment systems are operated near or below the limiting current density, sometimes in combination with reversal of direction of the electric current (as in Batchelder) in order to mitigate the precipitation and deposition of minerals to contact surfaces (column 1, line 62-column 2, line 19 and column 4, line 42-column 5, line 2, etc.) Such actions are taught as reducing “water splitting” or formation of hydroxyl ions. More specifically, in column 8, lines 34-47 and column 12, lines 35-38 and 45-51, Batchelder explicitly teaches operating the anion exchange membranes of an electrodialysis or electrodeionizing device to have a reduced water-splitting capacity and to operate the cation exchange membranes of such device to have a relatively limited water-splitting capacity compared to enhanced water splitting membranes, with such objectives realized by limiting current densities [as required by claim 3].

Thus, it would have been obvious for one of ordinary skill in the art to have controlled the EDI process in the Liang et al system by operating near or below the limiting current density to minimize water splitting, or formation of hydroxyl ions, as taught by Batchelder, to further limit the amount of precipitation occurring on the EDI surfaces and downstream of the device

Art Unit: 1797

especially in the concentrating stream, so as to optimize the EDI operation in removal of salts and other contaminants.

Also if necessary, Stoddard explicitly teaches water treatment through an electrochemical, softening unit to provide water to household appliances such as dishwashers (c 1, l 25-35 with c 5, l 51-c 6, l 47).

Liang '422 also discloses the following for dependent claims: water distribution for claim 6,18 and 15 (c 10, l 40 “domestic applications”), flow rate and valve adjustment for claims 7 and 16 (c 10, l 40- c 11, l 19), storing of treated and untreated water in pressurized reservoir system for claims 8,12,29,30 and 9 (c 10, l 50), the parallel/serial arrangement providing mixing of treated and untreated water for claim 27, c 11, l 13-17.

Willman et al also discloses the following for dependent claims: water distribution for claim 6,18 and 15 (figs, p 3 esp use points 28 and 104), flow rate adjustment for claims 7 and 16 (p 30 ‘pressure regulator 32’), storing of treated and untreated water in pressurized reservoir system for claims 8,12,29,30 and 9 (pumps 16 and 58 pressurizing the entire Willman system), the parallel/serial arrangement providing mixing of treated and untreated water for claim 27, p 36.

Claims 4-7,13-16,19,20,28 and 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over one of Liang et al 5,292,422 or Willman et al PGPUBS US 2004/0118780 in view of Batchelder et al patent 6,126,805, and Stoddard patent 2,912,372 as applied to claims 1,8-12,17,18,22,27 and 29 above, and further in view of Rela patent 6,607,668.

These claims further differ in requiring measuring of at least one water property and controlling at least the EDI device based on such property although Willman does disclose

Art Unit: 1797

monitoring of conductivity property (p 30). However, Rela teaches a water treatment system that includes prefilter, reverse osmosis and use of an EDI unit such as in Hark and in which various water properties are sensed/measured and sensed values are used by the controller to control flow rates of raw water, flow rates of the water being distributed to end use points, amount of current applied to the electrodeionization device and other system parameters (col. 4, l 43-67, col. 10, l 28-40). It would have been also obvious to one of ordinary skill in the art to have incorporated the monitoring and control taught by Rela, into either the Liang or Willman system, so as to optimize overall performance of the water treatment system.

Applicant's arguments with respect to claims 1,3-20,22 and 27-32 have been considered but are moot in view of the new ground(s) of rejection including teachings of the newly cited prior art.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Drodge at telephone number 571-272-1140. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith, can be reached at 571-272-1166.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either private PAIR or Public PAIR, and through Private PAIR only for unpublished applications. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 10/712,685

Page 10

Art Unit: 1797

JWD

2/11/2010

/Joseph W. Drodge/

Primary Examiner, Art Unit 1797